



17663

16172

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) *All questions are compulsory.*
 - (2) *Answer each next main question on a new page.*
 - (3) *Illustrate your answers with neat sketches wherever necessary.*
 - (4) *Figures to the right indicate full marks.*
 - (5) *Assume suitable data, if necessary.*

	Marks
1. A) Attempt any three :	12
a) Draw P and ID diagram for flow control system.	4
b) Explain the method of ratio control with a neat diagram.	4
c) List the features of a typical DCS.	4
d) Draw and explain feedback control system, to control the temperature of heat exchanger.	4
B) Attempt any one :	6
a) Explain in brief the documents required for the successful completion of an instrumentation project.	6
b) Draw and explain the cascade control loop for distillation column.	6
2. Attempt any two :	16
a) State the need of valve positioner. Explain any one type of valve positioner with a neat diagram.	8
b) i) Draw and explain feed forward control loop for single effect evaporator.	6
ii) Explain the term batch process.	2
c) i) Enlist the advantages of DCS.	4
ii) Draw the schematic diagram of DCS for thermal power plant.	4
3. Attempt any four :	16
a) Draw and explain feed forward control of drum boiler.	4
b) Explain how flashing occurs in control valves. State the remedies to over come it.	4
c) Explain spit range control.	4
d) Find the value of Cv for a valve that must allow 500 gallons per minute of ethyl alcohol with a specific gravity of 0.9 at a minimum pressure of 20 psi. Estimate the required valve size.	4
e) i) Name the developers of Mod bus and control net.	2
ii) Enlist any four features of profi-bus.	2

P.T.O.



	Marks
4. A) Attempt any three :	12
a) Draw the block diagram of process control system. Explain human aided control system with an example.	4
b) With respect to control valve explain direct and reverse action.	4
c) i) Explain the concept “unit operations”.	2
ii) Draw the feedback control scheme of dryer and label it.	2
d) Draw P and ID diagram for 3 element control system in boiler.	4
B) Attempt any one of the following :	6
a) With neat diagram explain (1) single seated control valve (2) double seated control valve.	6
b) Differentiate between single seated and double seated globe valve.	6
5. Attempt any two :	16
a) i) Explain the technique of adaptive control for process control systems.	4
ii) Explain the necessity of valve positioners.	4
b) i) Draw P and ID schematic of multieffect evaporator with feedback control.	4
ii) State the need of instrument index sheet and data sheet.	4
c) i) Explain in brief overview and group displays of DCS.	4
ii) Draw the block diagram of TDC 3000 DCS system.	4
6. Attempt any four of the following :	16
a) Describe alarm and event management in DCS.	4
b) Enlist and explain the characteristics of control valve.	4
c) Describe any four safety interlocks for boilers.	4
d) Draw the block diagram of a temperature control system for any one application. Identify the elements used.	4
e) Draw P and ID symbols of (i) control valve with actuator (ii) orifice plate (iii) pressure controller (iv) level transmitter.	4